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Reserve

and later show red. The newly hatched bugs (fig. 1, *B*) have much the form of the adults. At first they are yellow, but they soon turn bright red, with a pale band across the abdomen. A few days before becoming adults they change to a brown-black color, but retain the pale band, which is partly covered by the wing pads.

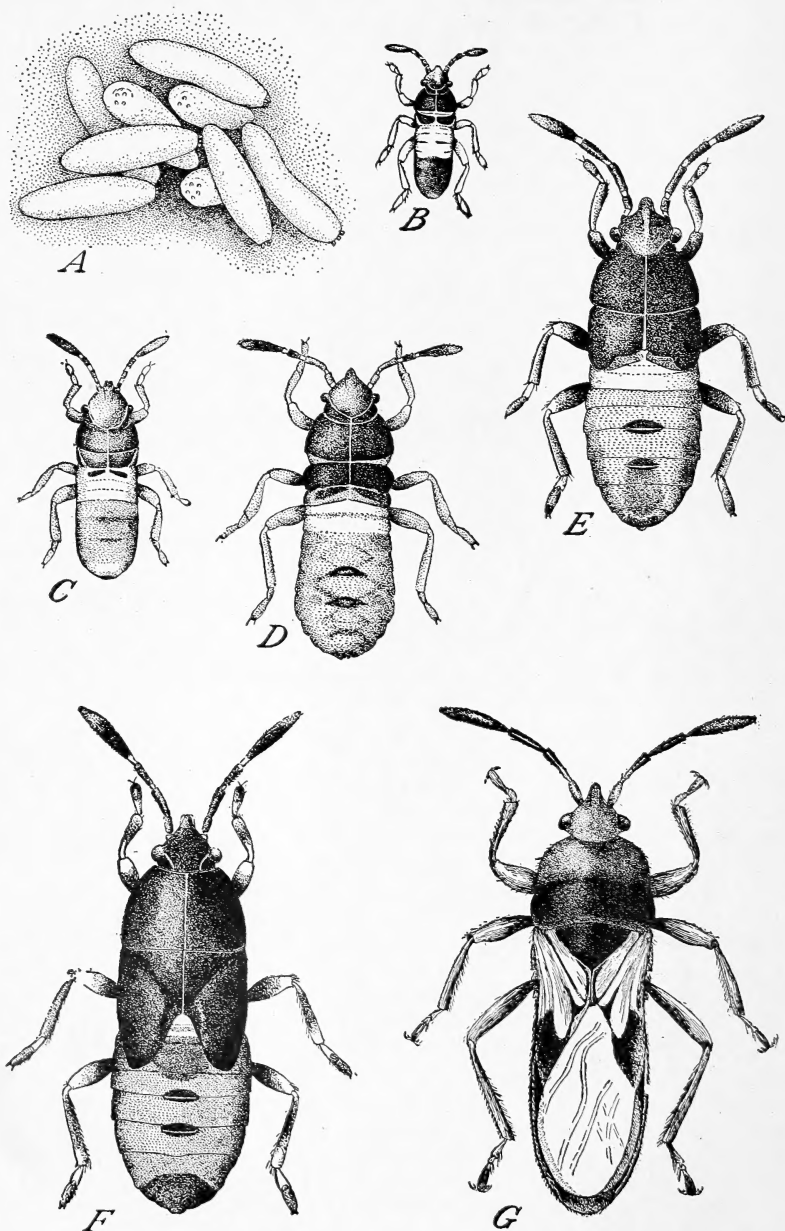


FIGURE 1.—The chinch bug: *A*, Eggs of the chinch bug very greatly enlarged; *B*, *C*, *D*, and *E*, first to fourth stages of the nymph or larva; *F*, last nymphal stage or pupa; *G*, adult female of the long-winged form, all greatly enlarged. (Luginbill.)

IMPORTANCE OF DAMAGE

Thousands of dollars are spent each year for replanting the St. Augustine grass which, in spots varying in size from a few square feet to several acres, has been killed by the chinch bug. This insect is the only serious enemy of St. Augustine grass. However, the loss is not confined to direct chinch bug injury, but results also from the replacement of this grass by less desirable grasses, which comes about because of the expense and labor of continual replanting and the unsightly appearance of the affected surface. In some districts the planting of St. Augustine grass has been practically abandoned, largely because of a general lack of knowledge regarding effective control measures.

WHERE AND WHEN INJURY OCCURS

Chinch bug injury occurs in all parts of Florida, being somewhat more severe in the central and southern portions of the peninsula.

Apparently little damage is done to St. Augustine grass in the other Southern States, in Cuba, or in Puerto Rico. Lawns on high, dry, sandy, or shell soils usually show damage first, probably because they do not retain moisture and are, therefore, least able to withstand the strain of an attack. Injury may occur at any time from May to November and is most evident during dry weather, largely because such conditions favor the rapid multiplication of the bugs, but partly because of the lowered vitality of the plants.

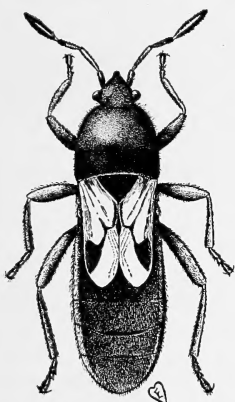


FIGURE 2.—Chinch bug: Adult female of the short-winged form. Magnified about 12 diameters. (Horton and Satterthwait.)

MANNER OF INJURY

Chinch bug injury to St. Augustine grass is first noticed in the dying out of the grass in small spots which increase in size with more or less rapidity and may finally cover a considerable area. On account of the progressive nature of the injury it is sometimes called

“dieback.” Several of these spots may start in a lawn and gradually fuse.

The type of injury of the chinch bugs and their destructiveness are largely a result of their gregarious habits of feeding. Many young and adult bugs collect at the base of one plant, draining its juices until it withers, and then leave it in a body for the nearest plant. The plants so attacked turn from green to a sickly yellow and soon wither and die.

Weeds spring up where the grass has been, increasing the unsightliness of the affected surface, but often the St. Augustine grass will gradually reoccupy the ground if given sufficient time. The common practice is to replant the grass, but unless the chinch bugs are first materially reduced in numbers the new plants in their turn are likely to be killed.

PLANTS ATTACKED

In the territory where chinch bug injury to St. Augustine grass is severe no other cultivated plants are seriously attacked, although the insect is known to feed on several wild and cultivated grasses.

STAGES AND LIFE CYCLE

Three general stages are recognized in the development of the chinch bug, namely, the egg, the nymph, and the adult.

Eggs are deposited on the St. Augustine grass at or near the points where it comes in contact with the soil, or they may be scattered about the plants in the soil. The eggs hatch into nymphs, in Florida during the summer in from 9 to 13 days, the average period of the egg stage being 11 days. The nymphs require, on an average, 30 days to reach maturity. They change color as already described and molt four times before becoming adults. The time which elapses after the adult stage is reached before the first eggs are laid ranges from 5 to 13 days, the average being 8 days. Thus the average length of the total life cycle is about 49 days.

NUMBER OF GENERATIONS

Since the average length of the chinch bug life cycle is 49 days, it is possible that in Florida at ordinary temperatures there are five or more generations a year. However, as the egg-laying periods extend over a considerable time, the generations become badly mixed, and, even in the spring, adults and all sizes of nymphs may be found together.

HIBERNATION

In northern Florida the adult chinch bugs hibernate or become dormant with the approach of cold weather. In the extreme southern portion of the peninsula it is probable that the adults are active during all but a few of the colder days of winter. Dry grass gradually collects about the roots of St. Augustine grass, particularly in the older lawns, affording ample shelter for the bugs' hibernation and rendering it unnecessary for them to leave their feeding grounds. This fact is confirmed by the knowledge that the spring infestation often starts where the injury stopped the preceding year. Spring infestation may sometimes also start around the bases of trees and palms, indicating that hibernation has been accomplished in these somewhat sheltered places.

NATURAL ENEMIES OF THE CHINCH BUG

In the district where St. Augustine grass is grown the natural enemies of the chinch bug, such as insects, reptiles, and birds, have little effect in controlling outbreaks of the pest.

Probably because of the repugnant odor of the chinch bug, the number and effectiveness of its enemies are not so great as with many insect pests. Among the insects known to attack it are lady beetles, ground beetles, lacewing flies, ants, and some of its near relatives among the true bugs.

The following birds have been mentioned by the Bureau of Biological Survey as eating chinch bugs: Bobwhite, prairie chicken, chimney swift, Traill's flycatcher, crow, red-winged blackbird, savanna sparrow, tree sparrow, cliff swallow, tree swallow, brown thrasher, Carolina wren, bluebird, flicker, kingbird, horned lark, starling, meadowlark, seaside sparrow, song sparrow, barn swallow, mockingbird, catbird, house wren, and robin. No fewer than 100 chinch bugs have been found in single stomachs of the bobwhite and meadowlark, and in a single instance 200 were taken from the stomach of a brown thrasher.

Although it has been shown that frogs will eat chinch bugs, it is readily seen that they can exert but little influence toward controlling this pest.

NATURAL CHECKS

DISEASE

Diseases, which in some part of the United States are often effective in controlling the chinch bug, have not been found in the district over which St. Augustine grass is grown. This is true in spite of the fact that much rain falls during the summer and that the humidity is high, thus, it would seem, creating particularly favorable conditions for the development of fungous diseases.

RAIN

Rain is undoubtedly the largest natural factor concerned in bringing about the control of this pest. Although the adult bugs are little affected by water, even when submerged for several hours or days, it is a well-known fact that small chinch bug nymphs are readily killed by rain. It is not unusual for rains to occur every day for several days during the summer, and this gradual killing off of the young nymphs eventually reduces the numbers of the insect until the injury is negligible.

CONTROL MEASURES

WATCHFULNESS

Watchfulness for the first evidence of chinch bug injury, combined with prompt application of remedial measures, will prevent practically all loss from this pest. The damage commences in small patches, as before described, and can be effectually stopped before further injury occurs. A commonplace practice in some localities has been to spray the grass with water, but in this way only the small nymphs can be killed, and since more are continually hatching it takes considerable time to bring an outbreak under control, as is often demonstrated at times of continued rains. Cold has little effect on the hibernating adults, and there seems to be no practical means of destroying them in their winter quarters.

INSECTICIDES

The quickest and most effective way of controlling chinch bug attacks on St. Augustine grass is by applying contact insecticides. The most convenient and easily obtained of these for the average

householder are the common laundry soaps. These soaps applied at the rate of 1 pound to 5 gallons of water, or a tobacco solution containing 40 percent of nicotine, used at the rate of 1 part to 800 parts of water, with 1 pound of soap to 25 gallons of the mixture, will effect complete control if properly applied. These solutions, however, have no effect upon the eggs of the chinch bug.

It is important that applications of insecticides be made when the first sign of injury is noted. As plants which are yellowing, and probably the nearby plants, are the ones upon which the bugs are most numerous, these should be very thoroughly treated. Insecticides applied to the dead brown grass are largely wasted, as the insects have already left this in search of more attractive food. Usually a strip from 3 to 5 feet wide about the edge of an infested spot contains a large majority of the chinch bugs present, but careful examination of the grass should determine the extent of the surface to be treated.

Insecticides can be applied with some type of sprayer or with a common garden sprinkling can. The principal emphasis should be placed on the thoroughness of the application, the best method being simply to deluge the plants, since the bugs crawl quickly into trash and loose soil for shelter. The best success has been obtained where the insecticides were applied immediately after a rain or after the affected ground had been well irrigated. One thorough treatment will usually control an outbreak on any particular patch of ground, but another application may be necessary 2 weeks later if a large number of eggs have hatched.

A control measure which the Florida Agricultural Experiment Station² recommends is the use of calcium cyanide. In applying this, certain precautions must be taken to prevent burning the grass. The insecticide should be applied in the middle of a clear day after evaporation of dew and when there is no immediate likelihood of rain, as it is necessary that the grass remain perfectly dry until the cyanide has dissipated its strength. The cyanide should be applied very evenly, after which it would be desirable to sweep the grass immediately with an old broom so as to brush the insecticide off the green blades down into the mat of dead leaves and stems, in which the insects are present near the ground. This prevents burning the foliage and also places the insecticides in direct contact with the insects. **Great caution should be exercised in using the cyanide, as it is a violent poison. Those working with it should keep to the windward of its dust, and the container should be opened only where there is good ventilation.**

CULTURAL METHODS

St. Augustine grass should be kept in a thrifty condition, by irrigation and fertilization if necessary, so that its increased vitality will enable it better to withstand chinch bug injury. Resistance of the grass to injury is increased, also, when the grass is not mowed too closely during dry weather, and where attacks are imminent mowing should be delayed.

² Florida Agricultural Experiment Station Press Bulletin 371, The Chinch Bug on St. Augustine Grass Lawns.

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